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INFLUENCE OF TEACHER TRAINING ON USE OF MUSIC AS A MEDIUM OF TEACHING MATHEMATICS IN PRE PRIMARY SCHOOLS IN NAIROBI CITY COUNTY, KENYA

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Abstract:
Music is a significant teaching strategy in early childhood education it improves development of young children's self-confidence, self-esteem and their expression orally and mentally. Despite the fact that, use of music is a strategy that motivates and sustains children's interest in the learning of mathematics, research studies in this area are scanty. The purpose of this study therefore was to find out influence of preschool teacher training on the use of music as a mode of teaching mathematics within Kasarani, Nairobi County. The study sought to determine the link between preschool teacher training and use of music in teaching mathematics. The descriptive survey research design was used to structure and guide the study. The study's dependent variable was use of music as a medium of teaching mathematics while the independent variable was preschool teacher training in use of music in teaching mathematics. Random sampling was used to select 15 preschools out of the 30 targeted and purposive sampling used to select 15 head teachers out of 30 and 45 out of 90 preschool teachers. An observation guide and questionnaires were used to collect data for preschool teachers and head teachers. The study findings established a significant association between teacher training and use of music during mathematic instructions. The study concluded that preschool teachers in Kasarani Sub-County were using music to teach mathematics and that trained teachers used music to teach mathematics than their untrained counterparts. The study recommended the Kenya institute of curriculum

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development should come up with modules on step by step guidelines on how to teachers should integrate music during maths lessons.

Keywords: teacher; music; mathematics; instructions; training; preschool

1. Introduction

According to Mugo (2009), teacher training strongly influences how well or not teachers perform their duties and are thus an important variable in this study. Teacher training ensures that the educator learns how to prepare lessons and to use appropriate teaching methods.

As mentioned earlier, requirements for preschool teachers vary worldwide. Whereas a minimum of a higher diploma is required for one to be licensed teacher for child care centres in USA, the minimum requirement for one to join the profession in France is a degree. Likewise in New York, one should attain a master's degree in 5 years after employment (Whitebook, 2003). A pre-school licensed teacher in Japan should hold at least a degree while in Kenya; the minimum is a certificate with an entry of grade D+ at O level (Republic of Kenya, 2006). This low level of qualification and entry has caused dissatisfaction among stakeholders, hence the researcher's impetus to investigate whether this level of training has an impact on use of music in teaching mathematics.

An online survey by Lee (2008), to establish music practices and teachers needs for teaching in public preschools in South Korea consisted of 42 questions, divided into seven categories according to question content. Majority of the teachers stated that their lesson plans had group music experiences more than twice a week, lasting less than 30 minutes on average. The most important reason named for including music in the curriculum was enjoyment and recreation. Almost all teachers planned music curriculum with a weekly theme and chose songs to match the theme. Singing and finger play were said to be the most often occurring activities in public schools. Teachers taught songs using a piano accompaniment by a CD, and some common CD collections for music activities were discovered. Rhythmic instruments were always accessible instruments in a music centre, but a piano was the most frequently used by teachers during circle time in the classroom. Teachers acknowledged lack of ideas for music activity in pre- primary schools as a challenge. The majority of members requested more applicable and thorough pre-service and in-service music education programs for preschool teachers.

A study by Oduolowu (2012), recorded that preschool teachers attending training used teacher-centred methods when teaching, of which music is part. It was also found that although preschool teachers used the new curriculum, they did so with minimal materials and did not encourage hands-on activities in learning the contents of the curriculum. This however is inconsistent with Ngasike (2004), who asserted that training improved preschool teachers' ability to plan classroom teaching effectively and use of appropriate child-centred teaching methods. Nevertheless, the study discovered

that only 10% of the teachers in Kasarani division used play teaching strategies in teaching mathematics skills to preschool children. This is because of lack of teacher training programmes provided to the educators, who are concerned with the subject contents only while in training. There was need for further study in Kenya and specifically pre-primary schools to reveal whether teacher's training have a relationship with the use of music in teaching mathematics.

On a more positive note, Office of Technology Assessment (1995), indicates that strategies like appropriate and timely training, expertise to support and help teachers and time for teachers to learn, experiment with technology and work increases the use of technology in teaching. For preschool teachers to use music as a medium of instruction in teaching mathematics, they must have relevant knowledge and skills and receive proper training to equip them to meet this goal. This study explored preschool teacher's training on use of music in teaching mathematics in pre-primary schools in Nairobi.

In a study by NACECE (2002), results showed that the training teachers received affects the way they teach preschool children. Trained teachers have a positive relationship with the learners and also socialize well with them as they use the instructional materials (Homes, 1997). There is need for preschool teachers to undergo intensive training so that they can get equipped with knowledge and skills to cope well with the demanding nature of young children (Munyeki, 1987). The study further adds that when preschool teachers are trained they are in a better position to provide learners with appropriate materials during teaching. There was need to ascertain whether teachers training have a relationship in influencing the use of music in teaching mathematics.

According to Mwololo, Koech, Begi and Mutweleli (2012), on preschool teacher's knowledge and attitudes towards use of visual media, trained preschool teachers frequently used visual media than untrained teachers. The study concurs with Aila (2005) that trained teachers used instructional visual aids more often than untrained teachers. The studies focused on the aspect of trained and untrained teachers while the current study will focus on how the teachers' level of training affects the use of music as a medium of teaching mathematics in preschool schools.

Teachers' level of training and qualifications is essential in determining the teaching process. This is because teachers influence the use of music in teaching mathematics as well as detecting any problem associated with teaching and learning in the classrooms. Rotumoi (2012),explored factors influencing the choice of approaches used by preschool teachers in Baringo county, where majority of teachers were O level/KCSE holders, followed by A level then diploma holders, CPE/KCPE and degree holders, who were the least in number. The study looked at how teachers' level of training affected the choice of approaches used in preschools, while the current study will look at how the teachers level of training affects use of music as a medium of teaching mathematics in preschool schools.

According to Kinuthia, Kombo and Mweru (2013), administrators preferred to hire teachers with low levels of qualification so that they can pay them low wages as

opposed to degree holders, whose pay would be significantly higher. This was confirmed by the numbers as 71% of the teachers were trained, 23% were undergoing training and 4% were not trained. Of these, 66% were certificate holders, 15% were diploma graduates while 4% held a degree. A similar study by Muyoka (2012), revealed that 25 (65.8%) of the teachers had undergone certificate training, 12 (31.6%) had a diploma and 1 (2.6%) had a degree in ECDE. The results show that all the teachers were professionally qualified hence competent in teaching ECDE children. However, the study did not focus on how these competent teachers could use music as a medium of teaching mathematics in preschools; therefore this lays the foundation of this study.

Lack of knowledge and skills inhibit preschool teachers' chances of showing and teaching learners how to use music in mathematics teaching. A study done by Wambui (2013), on effect of use of instructional materials on leaner participation in science activities in preschool classrooms in Kiine discovered that out of 30 participants, 10 (33%) were diploma holders, 15 (50%) were certificate holders while 5 (17%) were untrained teachers. It was also found that instructional materials are underused in the area of study. One of the reasons attributed to this was lack of professional skills. The teachers in this study location were not highly qualified since the highest level of education was a diploma, while other teachers were not trained. The study concentrated on science activities in preschool classrooms while the current study will investigate how the level of training affects use of music as a medium of teaching mathematics in preschool schools.

2. Purpose of the Study

The study investigated influence of teacher training on use of music as a medium of teaching Mathematics in pre-primary schools in Nairobi City County.

3. Research Methodology

The descriptive survey design was used in this study. This is because it makes use of both qualitative and quantitative data to describe the state of affairs as they exit in the field. This design is simple and easy to execute yet can yield convenient information needed by the study (Muijs, 2004). The design was also deemed appropriate for use because it relies on individuals' reports of their knowledge, attitudes or behaviour. It assesses attitudes, opinions, demographic information and procedures (Ary Jacobs, & Razavieh, 2002; Creswell, 2009).

Teacher training was the independent variable while use of music in teaching mathematics was the dependent variable. The target population of the study was all the public preschools, preschool teachers and head teachers in Kasarani Nairobi County. Kasarani sub county has 30 public preschools with an average of 3 teachers per school based on these statistics the researcher targeted 90 preschool teachers;30 head teachers in all the 30 public pre-primary schools. Out of the 30 public preschool schools, 15 (50%) of them were randomly selected for the study by rotary to avoid bias.

3.1 Instrumentation

Questionnaire was used to collect data from teachers and head teachers. Questionnaire was used because it has greater anonymity and gathers data over a large sample. It is also convenient to administer as they are left with respondents to respond at their convenient time. A participant observation guide was used to collect information directly by observing and recording the current state of preschool teachers' use of music during the math lesson in public pre-primary schools and to ascertain the responses involving the influence of their level of training towards the extent to which they used music as a medium for teaching mathematics.

4. Findings and Discussions

The major task of this study was to establish the influence of teacher training on use of music in teaching mathematics. Preschool teachers' levels of training were certificate, diploma or degree in early childhood education. The results are presented in Figure 1.

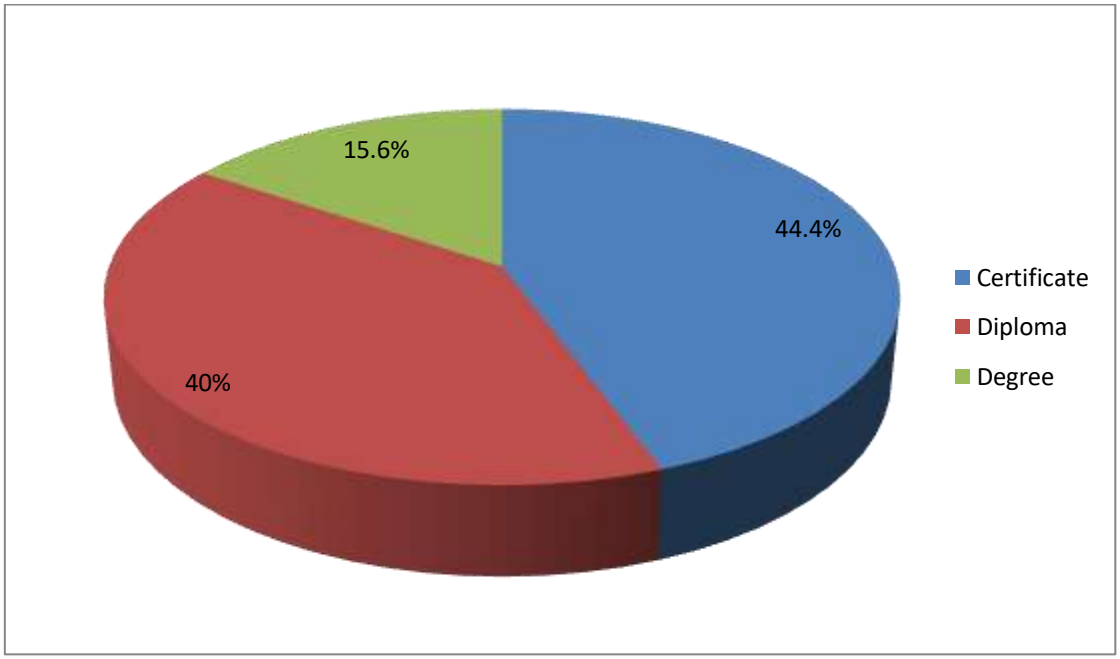

Figure 1: Proportions of teachers by Level of Training

Preschool teachers with certificate level of training in ECDE were 44.4%. Figure 4.2 also indicates that teachers with diploma level of training in ECDE were 40%. The figure further indicates that preschool teachers with degree level of training in ECDE were 15.6%. These findings indicate that preschool teachers in Kasarani Sub-county were adequately trained in early childhood education including music and movement and its relevance in teaching and learning at the preschool level.

Similarly, teachers were asked to indicate if they were "trained" or "Not trained" on use of music during instructions. The results obtained are presented in table Table 1.

Table 1: Teachers Level of Training in Use of Music to Teach Mathematics

Indicators	N	Min	Max	Mean	Std Dev
Trained on how to integrate music and other curriculum areas.	45	1	2	1.92	0.897
Trained on how to use music to make teaching/ learning interesting.	45	1	2	1.85	0.832
Trained on how to use music to improve children understanding.	45	1	2	1.68	0.789
Trained on how to use music to make learning activities run smoothly.	45	1	2	1.71	0.864
Trained on how to use music to teach mathematics activities.	45	1	2	1.97	0.943
Overall Mean	**45**	**2**	**2**	**1.826**	**0.865**

Table 1 illustrates per item mean for teachers' training in use of music during mathematic instruction were above 1.5 and the overall mean was 1.826 with a strong positive standard deviation (0.865). This means that teachers in Kasarani Sub-County are somewhat well trained in the use of music during instructions.

In particular, preschool teachers rated, "Trained on how to use music to teach mathematics activities" and "Trained on how to integrate music and other curriculum areas" highest with standard deviations of 0.943 and 0.897 respectively. Use music to make learning activities run smoothly and use music to make teaching interesting were also favourably rated at 0.864 and 0.832. Lastly, use music to improve children understanding was ranked last at 0.789. These findings are in agreement with a study conducted by Nyangeri (2014) who reported that preschool teachers in Tranzoia County were adequately trained on how to integrate music with other learnig/teaching areas.

The study went further to establish whether there was a statistically significant relationship between preschool teachers' level of training and their use of music in teaching mathematics. The following hypothesis was generated and tested.

Ho1: There is no significant relationship between teachers' level of training and their use of music in teaching mathematics at 0.05 level of significance.

In testing this null hypothesis, Chi-square test of the relationship was computed. The results are presented in Table 2.

Table 2: Chi-Square Correlation of the Association between Preschool Teachers' level of Training and Use of Music to Teach Mathematics

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.557[a]	4	.006*
Likelihood Ratio	20.122	4	.000
Linear-by-Linear Association	5.805	1	.016
N of Valid Cases	45		

The findings in Table 2 indicate that the chi-square test results for the association between preschool teachers' level of training and use of music to teach mathematics was 14.557 with a p-value of 0.006 level of significance (2-sided). These Chi-square

statisctics mean that there is a significant relationship between preschool teachers' level of training and the use of music to teach mathematics ($p=0.006<p=0.05$).

The generated hypothesis that stated that; There is no significant relationship between teachers' level of training and their use of music in teaching mathematics at 0.05 level of significance was therefore rejected and it's alternate adopted ($p<0.05$). These findings imply that trained teachers are more effective in use of music to teach mathematics.

These results find support in the work of Mwololo, Koech, Begi and Mutweleli (2012), on preschool teachers' knowledge and attitudes towards use of visual media, which confirmed that trained preschool teachers frequently used visual media than the untrained teachers. The study also concurs with Aila (2005), who noted that trained teachers used instructional visual aids more often in comparison to other candre of teachers.

The current study findings are also echoed by Ng'asike (2004) who comfirmed that teacher training levels have positive influence on teachers' tendencies in using child centered teaching approaches. Kinuthia (2009), further concurs that training enhances teachers' favourable attitudes towards subject areas, raises activity level and also influences the quality of services delivered.

However, the current findings are inconsistent with Waigera (2013), who reported that there was no significant difference between teachers' level of training and use of culturally relevant instructional materials in preschool schools.

5. Conclusion

There was a significant association between preschool teachers' training and their use of music to teach mathematics. It can therefore be concluded that a trained preschool teacher is more likely to use music to teach mathematics than an untrained preschool teacher when all other factors are kept constant.

6. Recommendations

From the study findings and resultant conclusions, the study made the following recommendation for practitioners and for further research:

6.1 Recommendation for Kenya Institute of Curriculum Development (KICD)

The KICD should come up with modules on step by step guidelines on how teachers should integrate music during teaching of mathematic concepts. The existing curriculum content gives teachers the idea that music is a lesson introduction and conclusion tool but not an instruction medium. The modules should emphasise on how to use music during lesson development to arouse, nurture and deepen preschool children mathematic concepts.

6.2 Recommendation for Ministry of Education Science and Technology

The ministry should increase adequate teaching resources for use of music in teaching mathematics. This can be done by ensuring they give more financial support in schools. Secondly the ministry for education for science and technology should enforce the provision and guidelines on how teachers should integrate music during teaching mathematics. Lastly, the ministry of Education Science and Technology should conduct regular audit and inspections in pre-primary schools to ensure conformity to the guidelines.

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